

## HITCH MOUNTED JEEP DOOR CARRIER

### Field of the Invention

The present invention relates to a storage device for removable vehicle doors, and, in particular, to a vehicle hitch mounted carrier for transporting the doors of Jeep-type vehicles.

### Background of the Invention

The classic Jeep vehicle continues to be a popular leisure and recreational transportation. Characterized by a retractable top and removable doors, the vehicle provides an open-air ambience in urban, rural and off-road settings. While the top may be conveniently stowed, the removable doors pose a greater storage problem. They may be inconveniently stored at the residence or garage and subject to inadvertent damage. Such off-site is also a problem if inclement weather is encountered or the vehicle is parked where security is an issue. Alternatively, the doors may be stored on board for use as needs arise, but at a sacrifice to passenger capacity and cargo space. Moreover, in the vehicle, the doors are unsecured and subject to damage.

Accordingly, it would be desirable to provide a safe and secure storage of the vehicle on-site for ready reinstallation as desired without sacrificing passenger comfort or cargo capacity.

### Summary of the Invention

The present invention hitch mounted carrier for removable Jeep doors on which the doors may be stowed and latched. The carrier includes a base frame that is pivotally mounted on the hitch moveable between a vertical raised stowed position adjacent the spare wheel during periods of non-use

and a horizontal lowered position. The frame includes a pair of folding side arm assemblies having mountings replicating the vehicle door frame. The arm assemblies include sets of hinge sleeves for receiving the door hinge pins and an opposed lock pins for engagement with the door latch mechanisms in replication of the mountings on the vehicle. Stored on the carriers, the doors are securely mounted without reducing passenger or cargo space. For replacement on the vehicle, the doors are conventionally unlatched, lifted from the side arm assemblies and reinstalled. The carrier may then be folded to the stowed position on the vehicle or removed for compact storage at the residence. The frame may also be utilized for carrying other cargo such as coolers, recreational equipment and the like.

Accordingly, it is an object of the invention to provide a carrier for removable vehicle doors that does not reduce passenger or cargo capacity of the vehicle.

Another object of the invention to provide a hitch mounted carrier for Jeep type vehicle removable doors.

A further object of the invention is to provide a carrier for removable vehicle doors at a mounting replicating vehicle mounting thereof.

Yet another object of the invention is to provide a folding carrier for Jeep-type removable doors that may be readily converted from a compact stowed position to an operative carrying position for transporting.

#### Description of the Drawings

The above and other objects and advantages of the present invention will become apparent upon reading the following detailed description taken in conjunction with the accompanying drawings in which:

Figure 1 is a side view of a door carrier according to a preferred embodiment of the invention mounted on a vehicle hitch of a Jeep-type vehicle and showing the doors carried thereon in dashed lines;

Figure 2 is a side view of the door carrier in the deployed door carrying position;

Figure 3 is a side view of the door carrier in the stowed position;

Figure 4 is an end view of the door carrier in the deployed door carrying position;

Figure 5 is an end view of the door carrier with the side frames in the folded position;

Figure 6 is a fragmentary side view of the door mounted on the vehicle;

Figure 7 is a top view of the door carried in the lowered position with the side arms folded;

Figure 8 is an enlarged view of the door hinge mounting on the door carrier taken in circle 8-8 of Figure 1;

Figure 9 is an enlarged view of the door latch mounting on the door carrier taken in circle 9-9 of Figure 1; and

Figure 10 is a prior art view of Jeep type vehicle provided with removable doors for transport on the door carrier.

#### Detailed Description of the Preferred Embodiments

Referring to the drawings, Figure 1 illustrates a Jeep-type vehicle 10 having a door carrier 12 mounted at a conventional rearwardly extending Reese-type a hitch 14. As shown in Figure 1, a typical vehicle 10 is provided with a pair of removable side doors 16 mounted in a vertically

door hinge set 18. As shown in Figure 6, the doors 16 of such vehicles are characterized by a pair of downwardly projecting circular hinge pins 20 carried on exterior door mounted brackets 21. The hinge pins 20 are journaled in hinge sleeves 22 mounted at the front vehicle door frame 24. The doors 16 also include a door latch mechanism 26 operated by exterior and interior handles 28. The latch mechanism 26 releasably engages a transverse cylindrical lock pin 30 projecting forwardly from the rear door frame 32 for locking and unlocking the door.

In such vehicles, the doors 16 may be removed from the vehicle by operating the handle 28 to unlatch the mechanism 26, opening the door, and thereafter vertically raising the door to remove the hinge pins 20 from the sleeves 22. After removal, as shown in Figure 1, the doors 16 may be mounted on the carrier 12 as indicated by the dashed lines in Figure 1 and thereat captively held by hinge brackets 36 and latch pins 38 replicating the vehicle door mounting. The vertical spacing and locations of the hinge pins and latching mechanisms for Jeep-type doors has remained consistent over an extended period of time permitting the invention to be utilized by a wide range of new and used vehicles.

Referring to Figures 2 through 5, the carrier 12 includes a base frame 40 and a pair of laterally spaced pivoting side frames 42. The base frame 40 is connected at a front pivot assembly 44 to a mounting tube 46 for pivotal movement about a transverse horizontal axis 47. The mounting tube 46 has a front end that is conventionally telescopically received within the receiver 48 of the hitch 14 and conventionally secured thereto by a cross pin 49.

Referring additionally to Figure 7, the base frame 40 includes a center strut 50 having a transverse front rail 52 attached to a top surface adjacent the front pivot assembly 44 and a longitudinally spaced transverse rear rail 54 attached to the top surface at the rearward end thereof. Preferably, the center strut is an elongated metallic tube and the rails 52, 54 are elongated metallic angles. The rails 52, 54 are fixedly attached to the strut 50 by welding or mechanical fastening. The ends of the rails 52, 54 are interconnected by side rails 56. As shown most clearly in Figure 5, V-shaped lateral reinforcing straps 58 are connected at ends to the outer portions of the rails at the center to the bottom surface of the strut 50.

The front pivot assembly 44 pivotally interconnects the center strut and the mounting tube for movement between a horizontal lowered position shown in Figure 2 and a vertical raised position shown in Figure 3. The rear end of the mounting tube 46 is beveled as shown in Figure 8. A pair of rectangular hinge plates 60 are welded to the sides of the mounting tube 46. The center strut 50 includes a beveled front end that engages the rear end of the mounting tube 46 in the horizontal position. A pivot pin assembly 62 connects the center strut 50 to the hinge plates 60 for rotation about axis 47. A locking pin 64 extends through aligned apertures in the plates 60 and the strut 50 to lock the frame in the horizontal position. The pin 64 is maintained with a removable cotter pin 66 (Figure 4). In the raised position, the pin 64 extends through the plate apertures and engages the bottom surface of the strut 50 to maintain the raised vertical position.

Each side frame 42 includes a pair of spaced legs 80 interconnected by cross bar 82. The lower ends of the legs 80 are received in the rails 52,

54 and pivotally connected to the side walls thereof by pivot connections 84 for movement about a longitudinal axis between a vertical raised position and a lower horizontal stowed position nesting in the rails. End angles 86 are attached across the ends of the rails 52, 54. A threaded fastener 90 including knob 91 extends through a cross hole at the lower end of the leg 80 and is threaded into a threaded nut 92 carried on the lower leg of the angle 86 to maintain the side frames 42 in the vertical position. The fastener 90 is unthreaded from the nut 92 to permit rotation to the lowered nested position (Figures 5 and 7).

The hinge brackets 36 are attached in vertically spaced pairs to one leg of each side frame. The vertical spacing is substantially the same as the spacing between the hinge pins 20 on the doors 16. The latch pin 38 is attached to the cross bar on the legs and projects inwardly toward the opposed hinge bracket set. The lateral spacing between the brackets 36 and the latch 38 is substantially the same as the spacing on the vehicle frame.

As shown in Figures 2 and 8, the hinge brackets 36 include a mounting plate 94 attached to the inner surface of the associated leg and a support sleeve 95 having a vertical passage for slidably accommodating the hinge pin of the door. As additionally shown in Figure 9, the cross bar 82 and the latch pin 38 are vertically located to register with and engage the keepers 96 of the latching mechanism of the door.

In use, the carrier 12 is preferably mounted in the fully folded condition shown in Figure 5. For assembly, the mounting tube 46 is telescoped into the hitch receiver 48 and latched by a conventional cross pin 49. For deployment in the door carrying mode, the pin 49 is removed from

pivot assembly 44 and the frame 40 pivoted about the horizontal transverse axis 47 of the pivot assembly to the horizontal position shown in Figure 2 and 3. The pin is then reinserted through the aligned apertures to lock the frame. The side frames 42 are then pivoted about the horizontal longitudinal axes 85 of the hinge assemblies to the raised positions shown in Figures 4 and 5 and locked in place by threading the fasteners 90 into the nuts 92.

For the illustrated bracket orientations, the passenger side door is first removed from the vehicle and the hinge pins 20 thereof inserted into the sleeves on the front hinge brackets with the door pivoted rearwardly. The door is then pivoted against the latch pin 38 causing the keepers 96 of the latch mechanism 26 to assume a locked condition therewith, thereby captively mounting the passenger door on the carrier. The door lock may be latched to further secure the door on the carrier. The driver side door is mounted at the rear position in a similar manner. The doors are removed for use on the vehicle by reverse methodology. The side arms are then folded down, and the base frame pivoted upwardly and locked. The vehicle may operate in the folded position with minimal rearward projection. Alternatively, the carrier may be removed and stowed in the vehicle cargo bed or moved to a separate storage location.

The door carrier may be also secondarily employed as a carrier for other recreational cargo such a coolers, suitcases, and other cargo thereby making available the vehicle freely available for front and rear seat passengers.

Having thus described a presently preferred embodiment of the present invention, it will now be appreciated that the objects of the invention

have been fully achieved, and it will be understood by those skilled in the art that many changes in construction and widely differing embodiments and applications of the invention will suggest themselves without departing from the spirit and scope of the present invention. The disclosures and description herein are intended to be illustrative and are not in any sense limiting of the invention, which is defined solely in accordance with the following claims.